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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/771,762

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Paul A. Rhea

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EXAMINER

LEE, PING

ART UNIT

PAPER NUMBER

2615

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/771,762	RHEA, PAUL A.	
	Examiner	Art Unit	
	Ping Lee	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/13/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15, 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the digital format tone" in 14. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether the tone is the tone defined on line 3 or line 13. Claim 19 has the similar defect.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-5, 8, 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen et al (hereafter Christensen) (US006304865B1) in view of Nathan et al (hereafter Nathan) (US007107109B1).

Christensen shows, in Fig. 3A, a sound card (200) having an input port (210) and output port (220) coupled to speakers. Although not explicitly discussed, one skilled in the art would have expected that the signals at the output port and input port are in analog format. Regarding claims 1-4 and 19, Christensen discloses that a tone is generated (step 410). Although not explicitly shown, the tone is inherently in digital

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format at a synthesizer (710). Since this tone in digital format would be applied to output port (220), so this tone would inherently be converted to analog format. As shown in Fig. 3B, this tone in analog format would be internally looped (since the internally generated signal at the port 220 has not be acoustically generated by the speaker, the internal signal transmitted by the cable 300 is considered to be internally looping) through an audio channel (210). Then the analog format tone would be converted to digital format (col. 4, line 45), and being recorded afterward (although not explicitly discussed, every digital signal to be processed within the computer is being recorded by a storage device). The recorded tone would be compared to the generated tone (col. 5) and designating the audio card as passing the audio pass (col. 5, lines 20-21) if the recorded tone is substantially similar to the generated tone.

Christensen fails to show the step of playing the analog format tone to a mixer of the audio sound card. Christensen teaches a general sound card without providing any detail audio signal processing capability. One skilled in the art would have expected that the method for testing the sound card as taught in Christensen could be applied to any specific sound card without generating any unexpected result. Nathan teaches a sound card that includes a digital mixer (20). One skilled in the art would have expected that the sound card could be modified to have an analog mixer instead of digital mixer to be located after the D/A converter. Thus, it would have been obvious to one of ordinary skill in the art to modify Christensen in view of Nathan by utilizing the testing method to test the sound card with analog mixer in order to automatically testing the sound card and eliminating the possible human error.

Regarding claim 5, since the synthesizer generates a tone with a designated frequency, so it is a frequency synthesizer.

Regarding claims 8-11, Christensen shows FFT (col. 5, line 65).

5. Claims 6 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen in view of Nathan as applied to claim 1 above, and further in view of Prockup (US006157505A).

Regarding claims 6 and 12-14, Christensen uses a neural network for performing the comparison, but fails to use a simple method to compare the intensity between the recorded tone and the generated tone. Prockup teaches a simple method of analyzing the received tone and the generated tone in order to determine whether an audio device has been performed properly. Prockup teaches that a tone generated from a tone wave table synthesizer (col. 4, lines 47-48), and the recorded tone would be converted to frequency domain using FFT. The converted data would be compared with the generated tone in terms of frequency and amplitude. Prockup teaches that the DC offset value is calculated (col. 7, lines 59-63 in view of Figs. 6A and 6B; as shown in Fig. 6B, the signal 130 is within an acceptable DC offset value comparing with 126 in Fig. 6A, signals 132 and 134 are not within acceptable DC offset value), and being compared with a known acceptable DC offset value (threshold), and the audio channel would be designated as failed if the calculated DC offset value is unacceptable. Thus, it would have been obvious to one of ordinary skill in the art to modify Christensen and Nathan by replacing the neural network with the signal analysis as taught by Prockup in

order to test the sound card using a simple straight forward method requiring less processing power.

6. Claims 19, 20 and 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al (hereafter Li) (US 20020083419A1) in view of Spoltman et al (hereafter Spoltman) (US 5,715,369) and Prockup.

Regarding claims 19, 20, 1, 2 and 8-11, Li discloses a method for automatically testing audio channels of an audio device with the steps of generating a tone in digital format at a synthesizer (although not shown, it is inherently provided) associated with a sound card, playing a first digital format tone from a sound card, recording the digital format tone and comparing the recorded digital format tone to the first digital format tone. However, Li fails to show a mixer, D/A conversion, A/D conversion, internal looping and using FFT for signal comparison. Li teaches a general sound card; however, one skilled in the art would have expected that the method taught in Li could be applied to any specific sound card, including sound card with mixer without generating any unexpected result. Spoltman teaches to use internal loop to feedback the output signal from the sound card to the input port, so the speaker and microphone would be bypassed (col. 1, lines 56-60) and the ambient noise would not be a part of the testing. Spoltman clearly teaches the digital tone generated is being converted using D/A converter (211) to analog format, and analog tone is being converted using A/D converter (210) to digital format. Prockup also teaches a method for analyzing audio data in order to test an audio device. By using FFT and comparing the original signal and the recorded signal in frequency domain, the microprocessor could

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determine whether the system has passed the audio test. Thus, it would have been obvious to one of ordinary skill in the art to modify Li in view of Spoltman and Prockup by feeding the generated analog tone through internal looping and using FFT for performing the signal analysis in order to eliminate the error caused by the microphone and speaker and obtain the testing result based on a simple comparison between the recorded signal and the original signal in frequency domain.

Regarding claims 3 and 4, Li teaches the frequency and the volume are predetermined.

Regarding claims 5 and 7, Li discloses the claimed frequency synthesizer and frequency modulation synthesizer (para. 0016).

Regarding claim 6, the claimed tone wave table is taught in Prockup (col. 4, lines 47-48).

Regarding claims 12 and 13, as taught in Prockup, the volume (in terms of amplitude) is being compared.

Regarding claim 14, Prockup teaches that the DC offset value is calculated (col. 7, lines 59-63 in view of Figs. 6A and 6B; as shown in Fig. 6B, the signal 130 is within an acceptable DC offset value comparing with 126 in Fig. 6A, signals 132 and 134 are not within acceptable DC offset value), and being compared with a known acceptable DC offset value (threshold), and the audio channel would be designated as failed if the calculated DC offset value is unacceptable.

Response to Arguments

7. Applicant's arguments with respect to claims 1 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522. The examiner can normally be reached on Monday, Wednesday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ping Lee/
Primary Examiner, Art Unit 2615

pwl